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OLYMPIC PATENT WORKS PLLC
P.O. BOX 4277
SEATTLE, WA 98104

EXAMINER
HULKA, JAMES R

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte STIAN HEGNA and GREGORY ERNEST PARKES

Appeal 2015-006208
Application 12/806,098
Technology Center 3600

Before LYNNE H. BROWNE, LISA M. GUIJT, and
BRENT M. DOUGAL, *Administrative Patent Judges*.

BROWNE, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Stian Hegna and Gregory Ernest Parkes (Appellants) appeal under 35 U.S.C. § 134 from the rejection of claims 1–20. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

CLAIMED SUBJECT MATTER

Claim 1, reproduced below, is illustrative of the claimed subject matter:

> 1. A method for determining a deghosted marine seismic energy source wavefield from signal recordings of seismic data acquired by actuating a first seismic source at a first time and one or more additional seismic sources at their own characteristic times with respect to an index time of the signal recordings, the sources substantially collocated and disposed at different depths in a body of water, comprising:
>
> determining from the signal recordings a first wavefield that would occur if the first source were actuated at a selected time with respect to an initiation time of the signal recordings, the first wavefield being time adjusted with respect to the depth in the water of the first source;
>
> determining from the signal recordings one or more additional wavefields that would occur if the one or more additional sources were each actuated at said selected time with respect to said initiation time of the signal recordings, the one or more additional wavefields being time adjusted with respect to the depths in the water of the one or more additional sources; and
>
> combining the first wavefield with the one or more additional wavefields to determine a deghosted wavefield corresponding to actuation of a single seismic source.

REFERENCES

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Grion	US 2006/0227660 A1	Oct. 12, 2006
Krohn	US 2006/0250891 A1	Nov. 9, 2006
Robertsson	US 2009/0097357 A1	Apr. 16, 2009
Dragoset	US 2009/0245022 A1	Oct. 1, 2009

B. J. Posthumus, *Deghosting Using a Twin Streamer Configuration*, Geophysical Prospecting 41, pp. 267–286 (1993) (hereinafter "Posthumus").

REJECTIONS

I. Claims 1–20 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

II. Claims 1–4, 6, 8, 11–15, and 18 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Robertsson and Grion.

III. Claims 7 and 17 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Robertsson, Grion, and Dragoset.

IV. Claims 5 and 16 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Robertsson, Grion, and Krohn.

V. Claims 9 and 19 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Robertsson, Grion, and Posthumus.

VI. Claims 10 and 20 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Robertsson, Grion, Krohn, and Posthumus.

DISCUSSION

Rejection I

The Examiner determines that claims 1–20 are directed to non-statutory subject matter. *See* Non-Final Act. 2. In support of this determination the Examiner finds that:

> The claim(s) is/are directed to the abstract idea of applying a mathematical formula to one or more algorithms or functions. The additional element(s) or combination of elements in the claim(s) other than the abstract idea per se amount(s) to no more than: mere instructions to implement the idea on a computer. Any active transformation of energy from electrical to acoustic or acoustic into electrical appears to be extraneous to the invention.

Id.

Appellants contend that the Examiner has not properly applied the test for statutory subject matter set forth in *Alice Corp. Pty. Ltd. v. CLS Bank Int'l.*, 134 S. Ct. 2347, 2355 (2014) because the Examiner does not separately discuss the first and second steps. *See* Appeal Br. 5–8. However, as discussed *infra*, the rejection addresses both steps. Accordingly, Appellants do not apprise us of error.

The Supreme Court has set forth "a framework for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts." *Alice*, 134 S. Ct. at 2355 (citing *Mayo Collaborative Servs. v. Prometheus Labs, Inc.*, 132 S. Ct. 1289, 1294 (2012). According to the Supreme Court's framework, we must first determine whether the claims at issue are directed to one of those concepts (i.e., laws of nature, natural phenomena, and abstract ideas). *Id.* If so, we must secondly "consider the elements of each claim both individually and 'as an ordered combination' to determine whether the additional elements 'transform the nature of the claim' into a patent-eligible application." *Id.* The Supreme Court characterizes the second step of the analysis as "a search for an 'inventive concept' — i.e., an element or combination of elements that is 'sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.'" *Id.*

As noted *supra*, the Examiner finds that the claims at issue are directed to the abstract idea of "applying a mathematical formula to one or more algorithms or functions." Non-Final Act. 2. This finding fulfills the first step of the *Alice* framework in that the Examiner has determined that the claims are directed to an abstract idea. *See id.* Next, the Examiner considered the elements of the claim both individually and in combination

and determined that the claims do not amount to significantly more than a patent upon the abstract idea of applying a mathematical formula to one or more algorithms or functions. *See id.* In support of this determination, the Examiner noted that the elements in the claims other than the implementation of the instructions set forth therein "appear[] to be extraneous to the invention." *Id.* We agree. The claims merely set forth instructions for collecting and comparing data. *See, e.g.*, Clm. 1. Thus, the Examiner has properly applied the second step of the *Alice* framework. *See Electric Power Group, LLC v. Alstom S.A*, 830 F.3d 1350, 1353-54 (Fed. Cir. 2016) (explaining that an invention directed to the collection, manipulation, and display of data was an abstract process).

Appellants further argue that "[c]laims 1–20 are rooted in modern seismology in which actual responses of the earth's interior to seismic impulses generated by seismic sources are digitally recorded as seismic data." Appeal Br. 8. However, such recordation of data is merely the collection of data, which in the context of the instant invention amounts to no more than the implementation of an abstract idea. The rejection is not based on the fact that mathematical formulas are employed. Rather, as discussed *supra*, the basis of the rejection is that such formulas are only used to compare and display data.

In addition, Appellants argue that "claims 1 and 11 do not recite generic processes of *inputting* signal recordings of seismic data acquired by actuating a seismic source, removing the source wavefield from the seismic data, and *outputting* a source deghosted wavefield associated with the seismic source. Instead, claims 1-20 describe specific elements and limitations." Appeal Br. 9; *see also* Reply Br. 2. However, the fact that the

data manipulated is specific does not transform the data into patent eligible subject matter.

For these reasons, we sustain the Examiner's decision rejecting claims 1–20 as being directed to non-statutory subject matter.

Rejection II

Regarding independent claims 1 and 11, the Examiner finds, *inter alia*, that Robertsson discloses "determining from the signal recordings a first wavefield that would occur if the first source were actuated at a selected time with respect to an initiation time of recording seismic signals." Non-Final Act. 3 (citing Robertsson ¶ 81). Appellants contend that:

> Robertsson does not teach or suggest determining a wavefield in a signal recording based on the selected time with respect to an initiation time of recording seismic signals. Robertsson simply explains in paragraph 0081, with reference to Figure 9, how attenuating acoustic energy output from one seismic source can appear as shot noise in the recordings of seismic energy associated with a subsequently fired seismic source. By contrast, the first element of claim 1 is directed to *determining* form the signal recordings a first wavefield.

Appeal Br. 11.

Responding to this argument, the Examiner "notes that in [0063] Robertsson clearly describes that []Deghosting a wavefield generally refers to the process of removing the down-going wavefield (reflected wave off the ocean-air surface) from the upgoing wavefield (reflection off the ocean bottom)" and reiterates that "[w]hile Robertsson does not explicitly teach that there are sources actuated at different depths, this teaching is clearly present in Grion [Figure 4] — where sources (#405 and #410) are actuated, produce acoustic signals (#425, #430, #435, #440) that travel through the water." Ans. 4. The Examiner further concludes that "[t]he combination of

the teachings from Robertsson and Grion has shown that combining a plurality of wavefield to achieve a deghosted wavefield is obvious." *Id.* at 5. However, the Examiner never addresses the arguments pertaining to timing quoted *supra*.

As noted by Appellants in the Reply Brief, "claims 1 and 11 describe determining first and second wavefields with specific limitations regarding not only the depth *but also* the time when the sources were activated." Reply Br. 6. The Examiner fails to explain how these timing limitations are met by the prior art. *See* Non-Final Act. 3–4; *see also* Ans. 4–5. Thus, Appellants' argument is persuasive.

For this reason, we do not sustain the Examiner's decision rejecting claims 1 and 11, and claims 2–4, 6, 8, 12–15, and 18, which depend from either claim 1 or claim 11.

Rejections III–VI

Claims 5, 7, 9, 10, 16, 17, 19, and 20 rejected in Rejections III–VI depend from either claim 1 or claim 11. *See* Appeal Brief. 19–25. Rejections III–VI do not cure the deficiency in the Examiner's findings pertaining to the timing limitations discussed *supra*. Accordingly, we do not sustain the Examiner's decisions rejecting claims 5, 7, 9, 10, 16, 17, 19, and 20, for the same reason we do not sustain the Examiner's decision rejecting claims 1 and 11.

DECISION

The Examiner's rejection of claims 1–20 under 35 U.S.C. § 101 is AFFIRMED.

The Examiner's rejections of claims 1–20 under 35 U.S.C. § 103(a) are REVERSED.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED